Intergenerational transmission of the human capital: case of the heterogeneous families

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Abstract:

The objective of this paper is to analyse the intergenerational transmission mechanisms within a theoretical framework which presumes a heterogeneous family structure. For that, we propose a modified version of the Becker and Tomes model (1986) by assuming that there are two groups of children: the elder and the juniors. We try to see how according to the elder achievement, the parents modify their choices of education or of training for the juniors given returns and endowments.

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INTRODUCTION:

The question of intergenerational transmission and its interaction with income inequalities and human capital issues has caused considerable debate amongst economists and policy makers due to its importance in the development of education or family policies.

The sources of intergenerational transmission of human capital or income were underlined by economists through the introduction of abilities and endowments of both parents and children from a point of view of family altruism. In fact, one tries to measure family influence on children achievement exploring the correlation between parental and children variables when children enter the labour market and those of their parents. Children endowments are generally chosen by the parents following an optimal allocation of their resources between family consumption and investment in their children.

Becker and Tomes (1986) propose an intergenerational model based on human capital theory, which reflects the human capital investment decisions taken by parents for their children. By incorporating the constraints imposed by financial market, the authors raise the possibility that the correlation between parental and children outcomes is stronger in poor families than in richer ones.

Since Becker and Tomes model, the question of the way in which family influences the children outcomes inspire an abundant empirical literature on the measure of the intergenerational correlation of economic variables (in particular education and income). Most recent studies such as Behrman and Taubman (1990), Peters (1992), Solon (1992), Mulligan (1997), Eide and Showalter (1999) and Naga (2002) for the USA; Bjorklund and Jantti (1997) and Osterberg (2000) for Sweden, Couch and Dunn (1997) for Germany; Corak (2001) and Corak and Heisz (1999) for Canada, Dearden et al. (1997) for the United Kingdom, are based on this model. The major part of these studies found that the parental incomes effect decreases as parental income increases. Other studies showed, via international comparisons, that the more the distribution of income is compressed, the less is correlation incomes. Bjorklund and Janti (1997) compare intergenerational mobility in the United States with those in Scandinavian countries (Denmark, Sweden, Norway and Finland) and find a higher mobility

in all Scandinavian countries than in the United States. Bratberg, Nielsen and Vaage (2002) explore also the relationship between income inequalities and mobility and suggest the link between the intergenerational mobility and the transmission of inequalities. Solon (1998) estimates the correlation between parents and children incomes and found a correlation coefficient between 0.2 and 0.5.

In the model of Becker and Tomes, parents are assumed altruistic and take care about well-being of their children. Parents can transmit their endowments to their children genetically (genetics, cognitive abilities) or via home environment (environment, family behaviour) which affect the economic results of the children. Moreover, parents can influence children outcomes by investing in their human capital. Because of market imperfections, some families cannot invest optimally in the education of their offspring, which generates persistent intergenerational inequalities.

Moreover, traditional human capital approach aiming at explaining the intergenerational transmission of abilities and economic status formulated by Becker and Tomes (1979, 1986), suggests two explanations for the intergenerational correlation in income. First, most underlined, relates to human capital financing and credit constraints. The second states that the innate skills or abilities (independently of the accumulated human capital) are influenced by parents. These characteristics partially transmissible genetically, are influenced by education via human capital externalities (neighborhood effect) and parent abilities.

However, individuals tend to choose an occupation sometimes different from that of their parents. This choice does not find its explanation in the traditional human capital and intergenerational transmission models since those do not analyze heterogeneous human capital and consequently overlook the possibility of heterogeneous choices within the same family. Nevertheless, this heterogeneity can appear by different educational choices and orientations among the descendants from the same family.

In this paper, we examine heterogeneity of the educational choices and/or training within the same family by supposing two children groups: elder children and juniors. We try to show by this specification that parental choices in term of human capital investment in their children depend amongst other on the performance proxied by the elder group returns. This performance will be evaluated either compared to the individual endowments of each child, or to the market luck appreciated by the parents over first years of school path.

So parent educational decisions will not necessarily be identical for all their offspirng and there can be several choices according to children endowments but also according to their adaptability to labor market (training and vocational training) or the school (education).

However, if parents cannot evaluate individual characteristics of their children, they will proceed in a uniform way for all their siblings. The model that we propose below obeys this logic of tradeoff and allows a theoretical discussion around this question.

THE MODEL:

Our specification considers a family made up for each generation of parents and two children groups: older and junior. As in Becker and Tomes (1979), we suppose that the children endowments in human capital are chosen by their parents following an optimal allocation of parental resources. These endowments will make it possible later for children to generate incomes proportionally to their returns and their human capital.

Supposing a Cobb Douglas parental utility function:

$$U_t = (Z_t)^{\theta} \left(y^1_{t+1}\right)^{1-\theta} \left(y^2_{t+1}\right)^{1-\theta}$$

With: Z_t : parental consumption

y^1_{t+1} : First group children outcome.

y^2_{t+1} : Second group children outcome[2]

The parental utility function depends on their own consumption and future outcomes of their children. θ expresses the preference for children outcomes. It describes the degree of parental altruism.

The equation of income/outcome is given by:

$$y_x = (1 + r_x) I_x + a_x \qquad x = t, t+1$$

I_x : Educational investment in generation X

a_x : Individual abilities of generation X

We supposed that returns to investment on the two groups of children are equal and are denoted r^1_{t+1} for the first group of children and r^2_{t+1} for the second group. Hence, the various equations of incomes are:

$y_t = (1 + r_t) I_t + a_t$ for parents.

[2] Since well being can be expressed as a permanent income, Becker suggests to consider Z and Y as flows. For more details, see Becker and Ghez (1976).

$y_{t+1}^{1} = \left(1 + r^{1}{}_{t+1}\right) I_{t+1}^{1} + a_{t+1}^{1}$ for elder children.

$y_{t+1}^{2} = \left(1 + r^{2}{}_{t+1}\right) I_{t+1}^{2} + a_{t+1}^{2}$ for junior children.

The parent problem consists in maximizing their utility function according to a budgetary constraint:

$$\max U_t = \left[(Z_t)^{\theta} \left(y_{t+1}^{1}\right)^{1-\theta} \left(y_{t+1}^{2}\right)^{1-\theta} \right]$$

s.t $Z_t + I_{t+1}^{1} + I_{t+2}^{2} = y_t$

The Lagrangian corresponding to this problem is as :

$$L = \left[(Z_t)^{\theta} \left(y_{t+1}^{1}\right)^{1-\theta} \left(y_{t+1}^{2}\right)^{1-\theta} \right] - \lambda \left[Z_t + I_{t+1}^{1} + I_{t+2}^{2} - y_t \right]$$

From the first order conditions, one obtains:

$$\left(1 + r_{t+1}^{2}\right) y_{t+1}^{1} = \left(1 + r_{t+1}^{1}\right) y_{t+1}^{2}$$

At the equilibrium, the ratio of two children group's outcomes is equal to the ratio of their two respective costs. Thus, at the optimum, parents are indifferent between investing in the first group and to give up or maintain the same choice for the second one because the two decisions generate the same return.

$$\Rightarrow \left(1 + r_{t+1}^{1}\right)\left(1 + r_{t+1}^{2}\right) I_{t+1}^{1} + a_{t+1}^{1}\left(1 + r_{t+1}^{2}\right) = \left(1 + r_{t+1}^{2}\right)\left(1 + r_{t+1}^{1}\right) I_{t+1}^{2} + a_{t+1}^{2}\left(1 + r_{t+1}^{1}\right)$$

From the budgetary constraint, we can derive:

$$Z_t + \left[\frac{y_{t+1}^{1}}{\left(1 + r_{t+1}^{1}\right)} - \frac{a_{t+1}^{1}}{\left(1 + r_{t+1}^{1}\right)} \right] + \left[\frac{y_{t+1}^{2}}{\left(1 + r_{t+1}^{2}\right)} - \frac{a_{t+1}^{2}}{\left(1 + r_{t+1}^{2}\right)} \right] = y_t$$

What gives us:

$$Z_t + \frac{y_{t+1}^{1}}{\left(1 + r_{t+1}^{1}\right)} + \frac{y_{t+1}^{2}}{\left(1 + r_{t+1}^{2}\right)} - \left[\frac{a_{t+1}^{1}}{\left(1 + r_{t+1}^{1}\right)} + \frac{a_{t+1}^{2}}{\left(1 + r_{t+1}^{2}\right)} \right] = y_t$$

There will be finally the expression:

$$y_t = Z_t + A y_{t+1}^{1} + B y_{t+1}^{2} + C\left(r_{t+1}^{1}, r_{t+1}^{2}\right)$$

Hence, parental income is a linear combination of the future outcomes of the two children groups. One can also write this relation utilizing only one of the two children groups to obtain:

$$y_t = \frac{2y^1_{t+1}}{1+r^1_{t+1}} - \left[\frac{a^1_{t+1}}{\left(1+r^1_{t+1}\right)} + \frac{a^2_{t+1}}{\left(1+r^2_{t+1}\right)} \right]$$

$$= \frac{2y^2_{t+1}}{1+r^2_{t+1}} - \left[\frac{a^1_{t+1}}{\left(1+r^1_{t+1}\right)} + \frac{a^2_{t+1}}{\left(1+r^2_{t+1}\right)} \right]$$

The relation between the parental income and those of the children thus appears to depend on two elements:

- The returns on investments carried out on both groups of children and of the returns of the educational effort provided by parents with regard to teaching of the children and framing.
- The children's endowments and thus their abilities and skills to learn and generate incomes.

Although parents are generally risk neutral, and are supposed to educate their children in the same way whichever the quantity and quality of children, it may be that the latter do not have the same competences and same skills and thus not the same returns. The parents will be then confronted with cases where the rates of returns of one child are higher than the rates for the other, even with identical investments for all the siblings. So the parental strategy with regards to school investments will be largely influenced by the outputs observed for both groups and by the abilities and the market luck of the children. Thus, parental decisions for educational choices will appear in three forms:

- Investment by compensation: parents support the less able child by investing disproportionally in this child.
- Investment according to comparative advantages: the education investment goes towards the most talented child in education and the training choice will be done for luckiest on the labour market.
- Egalitarian Investment: parents invest equally between all children.

2.1. The INVESTMENT BY COMPENSATION:

For this case, the parents support their less able children, independently of their sex, birth order, or other characteristics because the marginal utility of the children having a lower income always exceeds the marginal utility of the children having an higher income. One defines the marginal rate of substitution between I^1_{t+1} and I^2_{t+1} as:

$$TMS_{1/2} = \frac{\partial U_t / \partial y^1_{t+1}}{\partial U_t / \partial y^2_{t+1}}$$

This rate can be higher, lower, or equal to the unit:

$TMS_{1/2} > 1$ if $y^1_{t+1} < y^2_{t+1}$

$TMS_{1/2} = 1$ if $y^1_{t+1} = y^2_{t+1}$

$TMS_{1/2} < 1$ if $y^1_{t+1} > y^2_{t+1}$

If r^1_{t+1} and r^2_{t+1} are the returns of the additional investments in education for both groups of children, the utility is maximized when:

$$\frac{\partial U_t / \partial y^1_{t+1}}{\partial U_t / \partial y^2_{t+1}} = \frac{1+r^2_{t+1}}{1+r^1_{t+1}}$$

So as the marginal rate of substitution expresses the amount of investment which one must transfer from a group to the other to restore equity within the siblings and assuming that the equilibrium income of one group exceeds the income of the other group, the marginal returns of the two groups wouldn't be equal.

Indeed, ex post if $TMS_{1/2} \neq 1$, this implies that $I^1_{t+1} \neq I^2_{t+1}$ and thus $r^1_{t+1} \neq r^2_{t+1}$

And more precisely, if one has $r^1_{t+1} > r^2_{t+1} \Rightarrow I^1_{t+1} < I^2_{t+1}$

In this case parents judge that their less able children require an additional investment which will enable them to equalize returns between children. If it is supposed that the income differences are higher than the endowments differences, we will have the following relation:

$$\Delta I_{t+1} = \Delta a_{t+1} + \Delta y_{t+1} + r^1_{t+1} I^1_{t+1} - r^2_{t+1} I^2_{t+1}$$

Moreover, it is supposed that the endowments are equal; the variation in investments will then be explained by the variation of incomes which, in its turn, depends on the yields. Possibly, the returns of both groups are not equal and there is necessarily settlement between equity and efficiency. In the case of investment by compensation, equity prevails. Parents allow the less able group to catch up with their gap with the other. The share of parental incomes devoted to education of the children will then be shared unequally between the two groups.

Analytically, if one supposes that the first group is the group less endowed, one will have:

$$I^1_{t+1}=\alpha_1 y_t$$

$$I^2_{t+1}=\alpha_2 y_t$$

With α_1 is the share of parental incomes devoted to educational investment in the first group of children; α_2 the share devoted to the second group.

$$\alpha_1+\alpha_2=\alpha<1 \text{ and } \alpha_2 \leq \alpha_1$$

$$\Rightarrow \Delta I_{t+1} = I^1_{t+1} - I^2_{t+1} = (\alpha_1 - \alpha_2) y_t$$

knowing that $(\alpha_1 - \alpha_2) y_t = \Delta a_{t+1} + \Delta y_{t+1} + r^1_{t+1} I^1_{t+1} - r^2_{t+1} I^2_{t+1}$

The stressing of the difference between α_2 and α_1 produces two effects in the right side of this last equation:

- The anticipated outcome of the less able group will increase more proportionally according to the outcome equation and thus the difference in outcomes will be accentuated.
- As the return increases with parental income, an increase on income share devoted to the less able group makes increase their returns and thus reduce the gap between values of investments of the two groups. Conclusions are more ambiguous for poor families which generally do not invest in physical capital but more often in human capital.

If the same amount is invested in each the education of each child, the marginal return can be higher for the abler children, while the marginal utilities can be more important for the less endowed children. More human capital can be invested in more endowed only if the differences of the returns exceed the differences in marginal utilities. The poor families will face a dilemma between equity and efficiency and invest more in the abler children only if the efficiency is higher than equity. Therefore, income inequalities among siblings are weaker in poor families than in rich families. At the same time, the intergenerational inequalities can be larger in the poor families.

The conflict between efficiency and equity then represents the major concern for families given budgetary constraints and especially in the presence of capital market imperfection. This conflict can be reduced if the endowed children are altruistic and care about well-being of their brothers. In this case, they can for example show exchange of values, resources, encouragements, adding to mutual aid and supports. Intra and intergenerational solidarity will then become a capital element under these conditions. That makes it possible to have positive effects on the members of the siblings and can in the long term improve the returns and the

capacities of the less able children. However, in the presence of children heterogeneous in their endowments, parents find their choice of investment according to those: it is what we will examine in the following paragraph.

2.2. INVESTMENT BY COMPARATIVE ADVANTAGES:

The idea of investment proportionally to comparative advantages is based on the fact that one cannot always direct the entire dynasty to be provided for education and thus to obtain a school diploma. Thus, some members of the siblings tend more to better succeed and adapt in vocational training or training. The parents will then proceed by comparative advantages in order to determine the adequate decision for each child.

Indeed, children endowments can be written, in this case, in the following form:

$$a^{i}_{t+1}=u^{i}_{t+1}+v^{i}_{t+1}$$

u^{i}_{t+1} is the equipment in human capital of i^{th} group of children.

v^{i}_{t+1} is the market luck of the i^{th} group.

This last component expresses capital gain which results from the market luck. The parents will then direct their children towards education if the endowments human capital overrides the chance offered by the labour market and vice versa.

It is obvious that if the child is provided with education, the schooling cost will be higher compared to the case of a child directed towards the training. But, generally the returns offered by training are lower than those offered by education and also that the return of the training can appear on a shorter cycle than education.

Choosing for his/her children a vocational training concerns very often poor family's choices. Those tend more to direct their children towards training because this later is less expensive and especially profitable in the short run. For richer families, whose budget constraints are lower, educational choices are generally a desirable alternative for social reasons of prestige and return.

Formally, one has:

$$y^{1}_{t+1}=(1+r^{1})I^{1}_{t+1}+u^{1}_{t+1}+v^{1}_{t+1}$$

$$y^{2}_{t+1}=(1+r^{2})I^{2}_{t+1}+u^{2}_{t+1}+v^{2}_{t+1}$$

The equilibrium investment will be then:

$$I^{1}_{t+1}=\frac{y^{1}_{t+1}}{\left(1+r^{1}_{t+1}\right)}-\frac{u^{1}_{t+1}+v^{1}_{t+1}}{\left(1+r^{1}_{t+1}\right)}$$

$$I_{t+1}^{2}=\frac{y_{t+1}^{2}}{\left(1+r_{t+1}^{2}\right)}-\frac{u_{t+1}^{2}+v_{t+1}^{2}}{\left(1+r_{t+1}^{2}\right)}$$

Being the group more endowed in human capital (favoured in education), the first group will have a higher return in the mean and long terms, and thus educational investment in the first group children will be also more important. Indeed, education constitutes a costly investment since. The formation period is potentially quite long. Educate his/her children represents for parents sometimes inaccessible choice since it requires more expenditure such as school, accommodation, transport... Nevertheless, return to education will be higher compared to training, and an educated child could have, in theory, more outcomes on the labour market than a child having followed the vocational training.

Furthermore, the group directed towards training generates returns more quickly, and training is also less costly alternative. But its returns are generally lower than those to education.

It is clear that this settlement between relatively long schooling and work after a short period of training (learning) is explained primarily by three reasons: either by a lack of educational returns or by a scarcity of parental resources combined with credit market constraints, or by an lack of parental altruism. The parental behaviour aims on the one hand at maximizing the children well-being and on the other hand to share their resources between their offspring and themselves.

In Becker and Tomes (1986), two forms of endowments are at disposal: material endowments and those in human capital (educational expenditure). Under the assumption of free public school and supposing that children share their available time between work and education, educational expenditure represents the opportunity costs of non-work. The labour supply is in that case inversely proportional to endowments. This proposal is in the same line with results of the theoretical literature about child labour, in particular those of Beland and Robinson (2000) who show that altruistic parents are brought to offer an inefficiently high level of child labour when they cannot reach the loan and thus follow the least costly alternative in order to increase current family income to the detriment of that of the future one.

At the equilibrium we obtain:

$$\left(1+r^{2}\right)y_{t+1}^{1}=\left(1+r^{1}\right)y_{t+1}^{2}$$

$$\left(1+r_{t+1}^{1}\right)\left(1+r_{t+1}^{2}\right)\Delta I_{t+1}=\Delta u_{t+1}+\Delta v_{t+1}+\varphi(u,v,r)$$

Investment difference between the two groups can be due to human capital endowments variations and the market luck variation. Family investment allocation between the two

groups will thus be done proportionally to their endowments and their market lucks. Furthermore, choices are also influenced by home environment. In fact, two effects of family environment can be distinguished: first, a high level of parental investment in children human capital is selective because of unequal children abilities. One is likely to have a selection of various school itineraries or training for siblings. Second, there is a direct effect by which parents encourage or force even their children to accept school courses which were decided for them without holding account of their motivations and intentions.

Evidence shows us, for a given level of school performance, children from wealthier families tend to choose longer and more prestigious curriculums (with thus of the best outcome levels). This result was shown starting from the studies undertaken in several countries such as Micklewright (1989), Wadsworth (1991) for the United Kingdom, Sewell and Hauser (1976) for the USA, Sauvy and Girard (1965), Duru Bellat and Mingat (1993) for France, Erickson and Johnson (2000) for Sweden, or Gambetta (1987) for Italy.

Choice differences among siblings can also be influenced by credit constraints. Indeed, poor families would be constrained by capital markets (because of the absence of collateral). Such situations requires parents to choose the shortest and the less costly choice if not labour market. Caneiro and Heckman (2002) show that credit constraints are not the direct cause of school inequalities which rather stem from the modest households are making less ambitious school choices as regards children orientations.

Furthermore, credit constraints effect on parental choices can be showed differently. In fact, child work results often from lack of parental resources to face their consumption and educational expenditure. This budgetary constrains Children's schooling. Moreover, credit market imperfection generates a paradoxical situation: while at the same time returns to human capital investment are higher, parents do not have capacities on the short term to finance children schooling. One then attends cases of children non-schooling, phenomena of school drop out and leaving. Child labour can consequently represent for these poor families a solution to loosen their budgetary constraint.

Educational investments can be carried out by poor families if parents and children engage in an implied contract resting on an intertemporal investment. Children schooling fits then in logic of investment implying an intergenerational income transfer (Kotlikoff and Spivak 1981). In first period, parents finance children education, and anticipate receiving a transfer in second period, i.e. once they will have completed their school attainment and their professional insertion. This type of contract makes it possible to face a budgetary constraint and to mitigate capital market dysfunctions.

Likewise, if constraints of financing educational expenditure do not exist, and if children present all the same level of endowments and abilities, families will invest similarly among siblings and this without worrying about future returns of education or of their capacities and endowments to determine the value of investments devoted to children education.

2.3. EGALITARIAN INVESTMENT:

Egalitarian investment is based on the idea that parents set out again their resources intended for children's education in an equitable way between all siblings whatever their market luck or endowments. In this case, if one supposes that the share of parental incomes devoted to educational expenditure is I_{t+1}, the amount intended for each group will be half and one will thus have:

$$I_{t+1}^{1}=I_{t+1}^{2}=\frac{I_{t+1}}{2}=\frac{y_t-Z_t}{2}$$

Parental income will be so:

$$y_t=2I_{t+1}^{1}+Z_t$$

One sees well that in this case, returns to education do not matter for parents. Parental resource distribution between children's education and consumption is done according to equal division of the resources between siblings.

In addition, financing education poses, indeed, the problem of household capacity to spend induced educational expenditure by their decisions. Thus, the poor families, even if they set out again their resources in an equal way between their offspring, do not give the latter access to quality education. Inequalities in education access arise due to inequalities of incomes. One then attends coexistence of a public system considered to be popular and less costly, thus accommodating popular classes, and a private system accessible to the only wealthier households able to pay scholar fees and superiors to those required by public system. Brief, this particular case of parental choice appears a priori more evoked in reality considering, on the one hand, difficulty of measurement of the equipments of the children and on the other hand, by problems arising from the determination of anticipated future income of the children.

CONCLUDING REMARKS:

Intergenerational transmission is largely dependent on family resources to undertake educational investment. Parental resources and family altruism are key elements in our analysis. Thus, the fact of supposing a parental utility function which depends on children

outcomes which are function of the acquired human capital but also of their endowments and market luck, allow us to conclude that the parental choices will be based on abilities and endowments of siblings. One can then have several alternatives for children in function, either of competences and school performances in the short run, or of capacities and endowments of each child, or while choosing an egalitarian strategy of equitable division of the resources on all the dynasty.

In addition, the poor families tend to support everyday consumption and the formations by training rather than the general trajectories of education (higher opportunity cost). Be added to this an imperfection of the capital markets which does not make it possible everyone to reach the optimal educational investment. The intervention of the State to restore balance appears imminent under these conditions, by founding an obligatory education or by financing a share of this education via the granting of the purses and the assistances to the poor families.

REFERENCES:

- Atkinson, A.B. (1981). "On Intergenerational Income Mobility in Britain." *Journal of PostKeynesian Economics*. Vol. 3 (Winter),.

Atkinson, A.B, Maynard, A.K and Trinder, C.G (1983). *Parents and Children: Incomes in Two Generations*. London: Heinemann Educational Books.

- Becker, G.S. A Treatise on the Family (Cambridge : Harvard University Press) 1991

- Becker, G.S and Tomes, N (1986). "Human Capital and the Rise and Fall of Families." *Journal of Labor Economics*. Vol. 4, No.3 pt.2, pp. S1-S39.

- Becker, G.S and Tomes, N (1979). "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility." *Journal of Political Economy*. Vol. 87, No. 6.

- Behrman, J.R. And Taubman, P (1990). "The Intergenerational Correlation between Children's Adult Earnings and their Parents' Income: Results from the Michigan Panel Survey of Income Dynamics." *Review of Income and Wealth*. Series 36, No.2 (June),

- Bjorklund, A et Jänti, M.(1997). Intergenerational income mobility in Sweden compared to the united states, American Economic Review 87(5)

- Bowles, S. and H. Gintis (2002), 'The Inheritance of Inequality', *The Journal of Economic Perspectives*, 16,.

- Couch, K and Dunn, T.A(1997). Intergenerational Correlations in Labor Market Status: A Comparison of the United States and Germany". Journal of Human Resources, 32(1)

- Corak, M. (2001), 'Are the kids all right? Intergenerational mobility and child wellbeing in Canada', mimeo, Statistics Canada.

- Corak, M. and Heisz, A. (1999). "The Intergenerational Earnings and Income Mobility of Canadian Men. Evidence from langitudinal income tax data; journal of human resources,34(3)
- Darden, L, Machin, S and Reed, H.(1997). Intergenerational mobility in Britain, Economic journal 107
- Eide, E.R. and M.H. Showalter (1999) "Factors affecting the transmission of earnings across generations: A quintile regression approach", *Journal of Human Resources,* 34 (2),
- Ghez G.R. et Becker G. S.(1975). *The Allocation of Time and Goods over the Life-Cycle.* New York: Columbia University Press (for the National Bureau of Economic Research
- Griliches, Z(1979), "Sibling Models and Data in Economics: Beginnings of a Survey," *Journal of Political Economy*, 87(5), Part 2: S37-S64.
- Hanchane S et Verdier E (2004) ; Diversifications des parcours de formation, norme sociale et aspirations familiales. document du travail du LEST
- Hertz, T. (2002), 'Intergenerational Economic Mobility of Black and White Family in the United States', paper presented at the Society of Labor Economist, Annual Meeting.
- Loury, G (1981); intergenerational transfers and the distribution of earning, Econometrica vol. 49 n
- Mulligan, Casey B. (1997). *Parental Priorities and Economic Inequality.* Chicago: University of Chicago Press.
- Naga, R. (2002), 'Estimating the intergenerational correlation of incomes: An errors in-variables framework', *Economica*, 69, 69-91.
- Osterberg, T. (2000), 'Intergenerational income mobility in Sweden: What do tax-data show?', *Review of Income and Wealth*, 46, pp.421-436.
- Solon, G. (1992), 'Intergenerational income mobility in the United States', *American Economic Review*, 82, 393-408.
- Solon, G(1999); intergenerational mobility in the labour market. Handbook of labour economics volume 3, Elseiver science, Oxford
- Peters, E.H. (1992). "Patterns of Intergenerational Mobility in Income and Earnings." *Review of Economics and Statistics.* Vol. 74, No. 3.
- Picketty, T(2000); theories of persistent inequality and intergenerational mobility, Handbook of income distribution volume 1, Elseiver science, Oxford
- Rawls, John, (1971).A Theory of Justice. Cambridge, MA: Belknap
- Zimmerman, D. (1992), 'Regression toward mediocrity in economic stature', A*merican Economic Review*, 82, 409-429.